

CLAIMS

What is claimed is:

- 1 1. A method comprising, for each of a plurality of blocks in an image, generating
2 compressed information including information representing a single color
3 value and information representing a plurality of color palette indices.
- 1 2. The method of claim 1, wherein the blocks are texture blocks, the image is a
2 texture, and the compressed information is compressed texture information.
- 1 3. The method of claim 2, further comprising:
2 assigning a first color value to a first texture block and a second color value to
3 a second texture block;
4 calculating an error function for a texel in the first texture block, the error
5 function indicates the similarity of an uncompressed texel color value and the
6 second color value; and
7 reducing the error function for the texel by changing the second color value.
- 1 4. The method of claim 3, wherein reducing the error function is performed using
2 the Greedy Algorithm.
- 1 5. The method of claim 2, wherein the generating compressed texture information
2 is done without determining sequences of repeating elements.
- 1 6. The method of claim 3, wherein the first texture block and the second texture
2 block are adjacent texture blocks.

- 1 7. The method of claim 2, wherein the plurality of texture blocks comprise a
2 plurality of 4x4 texel blocks.
- 1 8. A machine-readable medium having stored thereon data representing
2 sequences of instructions, the sequences of instructions which, when executed
3 by a processor, cause the processor to generate compressed texture information
4 including information representing a single color value and information
5 representing a plurality of color palette indices, for each of a plurality of
6 texture blocks in a texture.
- 1 9. The machine-readable medium of claim 8, wherein the instructions further
2 comprise instructions which, when executed by a processor, cause the
3 processor to:
- 4 assign a first color value to a first texture block and a second color value to a
5 second texture block;
- 6 calculate an error function for a texel in the first texture block, the error
7 function compares the similarity of an uncompressed texel color value and the
8 second color value; and
- 9 reduce the error function for the texel by changing the second color value.
- 1 10. A texture compression method comprising:
- 2 dividing a texture into a plurality of non-overlapping texture blocks including a
3 first texture block and a second texture block;

4 determining a color palette for the first texture block, the color palette
5 including a plurality of colors values and at least one of the plurality of color
6 values is stored and associated with the second texture block; and
7 compressing the first texture block by determining indices for a plurality of
8 texels in the first texture block to color values in the color palette and storing
9 compressed texture information which includes these indices.

1 11. The method of claim 10, wherein the color palette further comprises a color
2 value that is to be stored for the first texture block.

1 12. The method of claim 11, wherein the color palette further comprises a second
2 color value that is to be stored for the first texture block.

1 13. The method of claim 10, wherein creating a color palette further comprises
2 calculating a difference between an uncompressed texel color value and a color
3 value in the color palette for that texture block, and reducing the difference by
4 changing the color value to be stored for the second texture block.

1 14. The method of claim 10, wherein the texture is a plurality of two-dimensional
2 textures and the first texture block is contained in one of the two-dimensional
3 textures.

1 15. A texture decompression method comprising, for each of a plurality of texture
2 blocks in a texture, decompressing compressed texture information associated
3 with the texture block, including information representing a single color value
4 and information representing a plurality of color palette indices.

- 1 16. The method of claim 15, wherein the compressed texture information further
2 includes a local palette pattern that identifies which of one or more color
3 values stored for one or more other texture blocks are to be used to construct a
4 color palette for each of the plurality of texture blocks.
- 1 17. A method of decompressing compressed texture information comprising:
2 accessing the compressed texture information for a texture block from a
3 memory, the compressed texture information including information
4 representing one or more color values and information representing a plurality
5 of color palette indices;
6 reconstructing a color palette corresponding to the texture block, one or more
7 colors of the color palette based partly upon compressed texture information
8 stored for one or more other non-overlapping texture blocks; and
9 using a color palette index associates with a texel in the texture block to
10 determine which color of the color palette is to be associated with the texel.
- 1 18. The method of claim 17, wherein compressed texture information for other
2 non-overlapping texture blocks comprises compressed texture information for
3 other non-overlapping texture blocks sufficiently close to the texture block to
4 take advantage of regional color similarity.
- 1 19. The method of claim 17, wherein the color palette includes four color palette
2 entries and each of the plurality of color palette indices are represented by two
3 bits.

- 1 20. The method of claim 17, wherein the color palette is reconstructed according to
2 information corresponding to a local palette pattern and the local palette
3 pattern allows the color palette to be reconstructed using substantially few
4 accesses to main memory.
- 1 21. The method of claim 17, wherein the compressed texture information further
2 comprises local palette pattern information.
- 1 22. The method of claim 17, wherein the one or more other non-overlapping
2 texture blocks are two or more adjacent non-overlapping texture blocks.
- 1 23. The method of claim 17, wherein the one or more other non-overlapping
2 texture blocks are four or more adjacent non-overlapping texture blocks.
- 1 24. The method of claim 17, wherein reconstructing the color palette does not
2 include determining one or more color values by interpolation.
- 1 25. A machine-readable medium having stored thereon data representing
2 sequences of instructions, the sequences of instructions which, when executed
3 by a processor, cause the processor to:
4 access the compressed texture information for a texture block from a memory,
5 the compressed texture information including information representing one or
6 more color values and information representing a plurality of color palette
7 indices;

8 reconstruct a color palette corresponding to the texture block based upon
9 compressed texture information stored for one or more other non-overlapping
10 texture blocks;

11 use information representing a color palette index to produce a color for a texel
12 in the texture block.

1 26. The apparatus of claim 25 wherein the instructions for reconstructing the color
2 palette further comprise instructions causing the machine to perform operations
3 comprising reconstructing the color palette without determining one or more
4 color values by interpolation.

1 27. A computer system for compressing texture information comprising a
2 processor for generating compressed texture information including information
3 representing a single color value and information representing a plurality of
4 color palette indices.

9 28. The computer system of claim 27, wherein the processor further operates to:

10 assign a first color value to a first texture block and a second color
11 value to a second texture block;

12 calculate an error function for a texel in the first texture block, the error
13 function compares the similarity of an uncompressed texel color
14 value and the second color value; and

15 reduce the error function for the texel by changing the second color
16 value.

- 1 29. A computer system for decompressing texture information comprising:
- 2 a pipeline for accessing the compressed texture information for a texture block
- 3 from a memory, the compressed texture information including information
- 4 representing one or more color values and information representing a plurality
- 5 of color palette indices;
- 6 a processor for reconstructing a color palette corresponding to the texture block
- 7 based upon compressed texture information for the texture block and
- 8 compressed texture information for one or more other non-overlapping texture
- 9 blocks; and
- 10 a processor for using information representing a color palette index to produce
- 11 a color for a texel in the texture block.
- 1 30. The computer system of claim 29, wherein the processor for reconstructing a
- 2 color palette.